CLAIMS

A printing method comprising: 1.

providing a substrate having a surface coated with a coating comprising at least 25%

printing on the coated surface with a liquid toner comprising pigmented polymer nano-silica by weight; and particles and a carrier liquid.

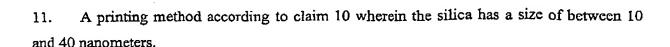
- A printing method according to claim 1 wherein the coating comprises an acrylic 2. material. 10
 - A printing method according to claim 2 wherein the acrylic material comprises a cross-3. linked polyacrylic ester.

- A printing method according any of the preceding claims wherein the coating is UV curcd.
 - A printing method according to any of the preceding claims wherein the coating 5. comprises at least 30% silica.
- A printing method according to claim 5 wherein the coating comprises at least 35% 20 6. silica.
- A printing method according to claim 6 wherein the coating comprises at least 40% 7. silica. 25
 - A printing method according to claim 7 wherein the coating comprises at least 45% 8. silica.
- A printing method according to claim 8 wherein the coating comprises at least 50% 9. 30 silica.

A printing method according to any of the preceding claims wherein the silica has a 10. size of between 5 and 50 nanor peters. 10







- 5 12. A printing method according to claim 11 wherein the silica has a size of between 10 and 20 nanometers.
 - 13. A printing method according to claim 12 wherein the silica has a size of about 16 nanometers.

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14. A printing method according to any of the preceding claims wherein the silica is not chemically bonded to the rest of the coating.

- 15. A printing method according to any of claims 1-13 wherein the silica is chemically bonded to the rest of the coating.
- 16. A printing method according to any of the preceding claims wherein the coating further comprises an anchorage agent.
- 20 17. A printing method according to claim 16 wherein the anchorage agent comprises an amine material.
 - 18. A printing method according to claim 17 wherein the amine material comprises a diamine terminated substance.
 - 19. A printing method according to claim 17 wherein the amine material comprises a monoamine terminated substance.
 - 20. A printing method according to claim 17 wherein the amine material comprises a triamine terminated substance.

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21. A printing method according to any of claims 18-20 wherein the substance is Poly(propylene oxide).





- 22. A printing method according to claim 18 wherein the substance is Poly-oxyelthelene.
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- 23. A printing method according to any of the preceding claims wherein the substrate and the pigmented particles are both acidic.
- 24. A printing method according to any of the preceding claims wherein the substrate is coated with a polyamide coating between the coating containing silica and the substrate.
- 25. A printing method according to any of the preceding claims wherein the substrate is PVC.

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- 26. A printing method according to any of claims 1-24 wherein the substrate is PET.
- 27. A printing method according to any of claims 1-24 wherein the substrate is polycarbonate.

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- 28. A printing method according to any of the preceding claims wherein the coating forms a substantially smooth surface.
- 20 29. A printing method according to any of the preceding claims wherein the substrate is a sheet of material.
 - 30. A printing method according to any of claims 1-28 wherein the substrate is a disk.

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- 31. A printing method according to any of the preceding claims wherein the surface of the coating is film.
- 32. A printing method according to claim 31 wherein the coating is smooth.
- 30 33. A substrate comprising:

 a sheet of polymer; and
 a printable coating in the form of a film, on the polymer sheet comprising at least 25% nano-silica by weight of total solids.

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- 34. A coated substrate according to claim 33 wherein the coating comprises an acrylic material.
- 35. A coated substrate according to claim 34 wherein the acrylic material comprises a cross-linked polyacrylic ester.

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- 36. A coated substrate according any of claims 33-35 wherein the coating is UV cured.
- 37. A coated substrate according to any of claims 33-36 wherein the coating comprises at least 30% silica.
- 38. A coated substrate according to claim 37 wherein the coating comprises at least 35% silica.
- 15 39. A coated substrate according to claim 38 wherein the coating comprises at least 40% silica.
 - 40. A coated substrate according to claim 39 wherein the coating comprises at least 45% silica.
 - 41. A coated substrate according to claim 40 wherein the coating comprises at least 50% silica.

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- 42. A coated substrate according to any of claims 33-41 wherein the silica has a size of between 5 and 50 nanometers.
- 43. A coated substrate according to claim 42 wherein the silica has a size of between 10 and 40 nanometers.
- 44. A coated substrate according to claim 43 wherein the silica has a size of between 10 and 20 nanometers.
 - 45. A coated substrate according to claim 44 wherein the silica has a size of about 16 nanometers.

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- 46. A coated substrate according to any of claims 33-45 wherein the silica is not chemically bound to the rest of the coating.
- 47. A coated substrate according to any of claims 33-45 wherein the silica is chemically bound to the rest of the coating.
- 48. A coated substrate according to any of claims 33-46 wherein the coating further comprises an anchorage agent.
- 49. A coated substrate according to claim 48 wherein the anchorage agent comprises an amine material.
- 50. A coated substrate according to claim 49 wherein the amine material comprises a diamine terminated substance.
 - 51. A coated substrate according to claim 49 wherein the amine material comprises a monoamine terminated substance.
- 20 52. A coated substrate according to claim 49 wherein the amine material comprises a triamine terminated substance.

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- 53. A coated substrate according to any of claims 50-52 wherein the substance is Poly(propylene oxide).
- 54. A printing method according to claim 50 wherein the substance is Poly-oxyelthelene.

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- 55. A coated substrate according to any of claims 33-54 wherein the substrate is acidic.
- 56. A coated substrate according to any of claims 33-54 wherein the substrate is coated with a polyamide coating between the coating containing silica and the sheet.
 - 57. A coated substrate according to any of claims 33-56 wherein the sheet is PVC.





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- 58. A coated substrate according to any of claims 33-56 wherein the sheet is PET.
- 59. A coated substrate according to an of claims 33-56 wherein the sheet is polycarbonate.

5 60. A coated substrate according to any of claims 33-59 wherein the coating is smooth.